CAIT
Center for Advanced Infrastructure & Transportation
Rutgers, The State University of New Jersey

QUARTERLY PROGRESS REPORT

Project Title:	Evaluation of Adaptive Control Strategies for NJ Highways
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Karl Brodtman
TASK ORDER NUMBER/Study Number: 101 / 4-26682	PRINCIPAL INVESTIGATOR: Kaan Ozbay
Study Start Date: 01/01/2001 Study End Date: 12/31/2003 No Cost Extension	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Task 1: Literature Survey	10%	30%	100%	10%
Task 2: Inventory Assessment	25%	20%	100%	25%
Task 3: Site Selection	5%	0%	100%	5%
Task 4: DSS Development	35%	10%	100%	35%
Task 5: Gap Analysis	5%	80%	100%	5%
Task 6: Implementation Strategies	5%	80%	80%	4%
Task 7: Training	5%			
Progress Reports				
Final Report	10%	30%	70%	7%
TOTAL	100%			91%

1. The percentages were adjusted to reflect the work needed for each task.

1. Progress this quarter by task:
Task1: This task is complete.
Tasks 2 and 3: We completed these tasks for the sites given to us by NJDOT.
Task 4: This task is complete.
Task 5: This task is complete.

Final Report: Parts of the final report that deal with the first 43 tasks and portion of task 4 was put together as a draft report.

2. Proposed activities for next quarter by task
Complete final report.

3. List of deliverables provided in this quarter by task (product date)

4. Progress on Implementation and Training Activities

5. Problems/Proposed Solutions

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	A Proposal for the Development of High Performances Concrete for Transportation Structures in New Jersey
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Tony Chmiel
TASK ORDER NUMBER: 62 / 4-23806	PRINCIPAL INVESTIGATOR: Hani Nassif
Project Starting Date: 04/30/2001 **Original** Project Ending Date: 2/1/2003 **Modified Completion Date:** 08/31/2003	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	0%	100%	5%
1. Collection of Data and Preparation of Samples During the Field Samples	20%	0%	100%	20%
2. Evaluation of Field Samples	10%	0%	100%	10%
3. Creep and Shrinkage Set-up and Testing	50%	0%	100%	50%
4. Preparation of Specifications for HPC	10%	5%	95%	9.5%
Final Report	5%	0%	100%	5%
TOTAL	100%			99.5%

Project Objectives:

To develop high performance concrete mix design and specifications for transportation structures using resources readily available in New Jersey.

Project Abstract:

The primary objective of this research is to identify high performance concrete (HPC) mix proportions that are suitable for transportation infrastructure in New Jersey. Two classes of concrete with compressive strengths ranging from 6 to 12 ksi are developed. Extensive information is available in the literature covering various aspects of HPC. Show case projects have been built in a number of northeast states including New Hampshire and Virginia. The research plan involves: (i) review of existing information, (ii) selection of mix proportions suitable for New Jersey using local aggregates and the proportions in Class A concrete, (iii) evaluation of trial mixes prepared in the laboratory and at least one ready-mix industry, (iv) evaluation of mechanical and long-term properties, and (v) preparation of specifications for the implementation of HPC in future projects.

1. Progress this quarter by task:
   - Updated creep data to reflect test duration of 180 days minimum in each creep test set-up.
   - Final report completed.
2. Proposed activities for next quarter by task:
   N/A
3. List of deliverables provided in this quarter by task (product date):
   N/A
4. Progress on Implementation and Training Activities:
   N/A
5. Problems/Proposed Solutions:
   N/A

Total Project Budget	$384,320.00
Modified Contract Amount:	
Total Project Expenditure to date	$384,320
% of Total Project Budget Expended	100%

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QUARTERLY PROGRESS REPORT

Project Title:	Evaluation Study of the NJ Turnpike Authority's Value Pricing Initiative
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Nancy Ciaruffoli
TASK ORDER NUMBER/Study Number: 114 / 4-26514	PRINCIPAL INVESTIGATOR: Kaan Ozbay (Rutgers) / Jose Holguin-Veras (RPI)
Study Start Date: 01/01/2002 Study End Date: 12/31/2004	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	25%	100%	5%
Task 1: Collect socio-economic characteristics of the users.	10%	15%	30%	3%
Task 2: Identification of toll structure changes.	2.5%	100%	100%	2.5%
Task 3: Traffic data collection.	5%	100%	50%	5%
Task 4: Assess impacts on users.	5%	40%	60%	3%
Task 5: Monitor media and decision-makers' reaction to value pricing	2.5%	30%	80%	2.0%
Tasks 6-7: Assemble panel of users. Collect travel behavior data.	20%	10%	10%	2%
Tasks 8-9: Behavioral modeling. Estimation of econometric parameters.	10%	20%	20%	2%
Task 10: Traffic modeling.	10%	30%	70%	7%
Task 11: Estimate congestion levels and travel time savings/losses for before and after conditions.	10%	20%	20%	2%
Task 12 : Estimate environmental impacts for before and after conditions.	5%			
Tasks 13-14: Estimate economic value of travel time savings. Differential impacts among user classes.	5%	20%	50%	2.5%
Final Report	10%	20%	40%	4%
TOTAL	100%			40%

1. Progress this quarter by task:

- Task 1: We continued to work on the possible questions for the focus groups and surveys.
- Task 3: We obtained complete 6 months data from NJTPK and completed the analysis of it.
- Task 4: We are analyzing the months traffic data to analyze the impact of "value pricing" on users
- Task 5: Martin Robbins and Allan Lichtensten of TPI and Kaan Ozbay and Ozlem Yanmaz of CAIT met with NJTPk to learn more about on the early stages of the "value pricing" project. Follow-up interviews with other major players were conducted by Allan Lichtensten of TPI.

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- Task 8-9: We continued to work on the design of surveys.
- Task 10: We continued to build the network around the NJTPk for the traffic modeling.
- Task 11: We continued to work on modeling the travel benefits. This will be fed into Task 10.
- Tasks 13 and 14: We continued to work on a value of time model that will be used to quantify the economic value of travel time savings in these tasks.

2. Proposed activities for next quarter by task

- Write a draft report that describes the work done so far.
- Complete the work related to surveys and analyze collected data.
- Work on the behavioral and traffic model to assess the impacts of value pricing

3. List of deliverables provided in this quarter by task (product date)

4. Progress on Implementation and Training Activities

5. Problems/Proposed Solutions

We received the final task order from NJDOT in order to start the work.

Total Project Budget	$ 477,468.00
Modified Contract Amount:	
Total Project Expenditure to date	$132,530
% of Total Project Budget Expended	28%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Estimation of Truck Volumes and Flows
RFP NUMBER: NJDOT 2001-18	NJDOT RESEARCH PROJECT MANAGER: Nicholas Vitillo
TASK ORDER NUMBER: 116 / 4-26855	PRINCIPAL INVESTIGATOR: Maria Boilé
Project Starting Date: 01/01/2002 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date: 8/31/2004**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	6%	-	100%	6%
1. Data Collection	8%	-	100%	8%
2. List of major truck generating facilities	8%	-	100%	8%
3. Criteria for factors that influence changes in truck flow	10%	-	100%	10%
4. Relationships between ADT and truck volumes	33%	10%	95%	31.35%
5. Methods to estimate truck flow and truck percentages	-	-	-	-
6. Validate the estimation method on a selection of 12 routes	17%	20%	55%	9.35%
7. Apply methodology on a statewide basis	8%	20%	20%	1.6%
Final Report	10%	5%	60%	6%
TOTAL	100%			80.30%

Project Objectives:

The objectives of this study are as follows:

- develop a database of truck classification counts, directly linked to existing NJDOT database systems
- develop methodologies for calculating truck volumes, flows and percentages on Interstates/Freeways, and principal arterials where some count information is available, and on lower facilites (principal and minor arterials) where little or no count information is available
- apply the methodology to New Jersey roadways to develop a GIS database of truck volumes, flows and percentages
- evaluate the methodology and the database developed using actual data collected through the NJDOT traffic monitoring system
- validate the method on a section of at least twelve highways, including four Interstate / Toll Authority routes, four principal arterials, two urban major arterials, and two rural major arterials

Project Abstract:

Freight transportation plays a vital role in the development and prosperity of a state such as New Jersey. More than 375 million tons of freight is transported each year in New Jersey. Trucks dominate this movement, accounting for 283 million tons. This project develops a procedure for estimating truck traffic on state highways, based on observed counts. A statistical approach is being developed for estimating truck volumes and flows, based primarily on classification counts and information on roadway functionality, employment, sales volume and number of establishments within the state. Models will be created that may predict the truck volumes at a certain location in the state. Profiles of truck traffic will also be developed for various roadways, indicating the ADT, truck and passenger car volumes and percentages. The procedure will be modeled within a GIS

framework, which facilitates data analysis and presentation. Within this framework, locations in the state highway network may be selected and based on a set of criteria the data associated with the network, truck volumes, traffic profile, truck percentage etc can be estimated. The models would be used to predict truck volumes on locations where actual observations are not available. The predicted volumes along with the observed ones would be used to determine the truck traffic patterns along state highways. Sensitivity analysis will be conducted to determine how the model behavior changes with variations in the explanatory variables. Although the proposed method will be applied to a selected sample of state highways, a procedure will be developed for the statewide application of this method.

1. Progress this quarter by task:

   Task 4: The models that have been developed using linear regression have been re-formulated as constrained models and have been re-estimated based on the observed data. The reason for testing these revised models being that the initial models, when used to make predictions on Truck volumes produce negative numbers in some instances. Although mathematically this has been expected, in reality it is known that truck volumes cannot have a negative value. In addition, based on the observed volumes, an upper and a lower bound may be set for the truck volumes on links adjacent to the observations.

   Task 6: Both the unconstraint and the constraint models have been tested on the selected roadways and predicted volumes are compared to the observed ones. In addition, sensitivity analysis has been performed and the results have been summarized. A GIS based tool is being developed for the purpose of automating the developed approach and facilitating visual observation and analysis of the results.

   Task 7: The suggested procedure for applying the methodology on a statewide basis is being developed.

   Final Report: The current version of the final report is being updated to include new methods and results that are being developed.

2. Proposed activities for next quarter by task:

   Task 4: Task 4 will be finalized and comparison of the two approaches, constraint and unconstraint, will be performed.

   Task 6: Results of the sensitivity analysis will be summarized and the models will be validated using the observed data. Visual images of the observed data and the predictive model results will be produced in GIS.

   Task 7: A near final draft of the report on how to implement the proposed approach on a statewide basis will be produced.

   Final Report: the current draft of the final report will be updated

3. List of deliverables provided in this quarter by task (product date):

   None

4. Progress on Implementation and Training Activities:

   Training material is being developed in parallel to the development of the GIS based framework

5. Problems/Proposed Solutions:

   None

Total Project Budget	$198,566
Modified Contract Amount:	
Total Project Expenditure to date	$147,036
% of Total Project Budget Expended	74%

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QUARTERLY PROGRESS REPORT

Project Title:	Transportation Safety Professional Development Clearinghouse
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Pat Ott
TASK ORDER NUMBER/Study Number: Task Order No. 144/ 4-29063	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg
Project Starting Date: 12/1/2003 **Original** Project Ending Date: 12/1/2005 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.0 Literature Search				
1.1 Conduct literature search	20	10	35	7
1.2 Prepare Presentation for NJDOT/FHWA	5	5	5	.25
2.0 Assessment			0	
2.1 Conduct Professional Assessment	20		0	
2.2 Present Findings to NJDOT/FHWA	5		0	
3.0 Training			0	
3.1 Schedule/Recruit Technical Training	10.5		0	
3.2 Distribute Information	3.5		0	
3.3 Organize Career Resource Center	6		0	
3.4 Develop Online Resource	30		0	
TOTAL	100			7.25%

Project Objectives: The goal of the Transportation Safety Professional Development Clearinghouse is to develop a pilot project that will provide assessment tools and online capabilities to promote and track continuing education activities for transportation safety professionals throughout New Jersey.

Project Abstract: Nationwide, the transportation community is facing a potential workforce crisis by the year 2010 because of the anticipated retirement and early retirement of the generation known as the "baby boomers". This potential loss of experience and expertise, along with advances in technology and an increased emphasis on safety and national security, has prompted Federal and State transportation agencies to focus on employee development as one of their strategic goals.

The CAIT-LTAP staff will work with managers and staff members of the transportation community to provide strategies for organizing professional development opportunities for transportation personnel. They will research training formats currently available to adult learners and evaluate the major delivery systems, including distance learning and traditional programs available through FHWA and other transportation agencies, to determine acceptability for training purposes. CAIT-LTAP will assist managers in conducting assessments of employees in order to determine the appropriate individual career development plan that is needed to fulfill professional goals. CAIT-LTAP will make recommendations regarding training opportunities that are available to staff members and will create an online data base accessible to each employee, incorporating appropriate security to maintain confidentiality. Assessments and individual development plans will be reviewed to determine a widespread need for a specific workshop, which would then be scheduled at Rutgers University.

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For limited training needs, the Rutgers staff will refer users to appropriate agencies that sponsor the needed training as well as neighboring colleges offering graduate and undergraduate courses.

This project will provide transportation facilitators, providers, and users with an online resource to archive and track continuing education in New Jersey. Specifically, it will allow NJDOT to track participants that are required to take safety training in New Jersey.

Progress this quarter by task:

1.1 The literature review has continued on a limited basis.

Proposed activities for next quarter by task:

1.1 Continuation of the literature review.
1.2 A) Meet with FHWA and DOT principals to clarify needs and refine scope of project.
B) Prepare presentation for FHWA and DOT.

List of deliverables provided in this quarter by task (product date):
None at this time.

Progress on Implementation and Training Activities:
Not at implementation.

Problems/Proposed Solutions:

1. This project will need to be extended to coincide with the Jan 1-Dec 31 CAIT timelines. This will be resolved by the account manager.
2. Since the professional development needs of Federal, State, and Local transportation professionals may be quite different, clarification of these needs is required in order to develop a plan that will be beneficial for all agencies. To achieve this, one or more meetings will be scheduled to further define the scope of the project.

Total Project Budget	$ 312,345.00
Modified Contract Amount	
Total Project Expenditure to date	$18.60
% of Total Project Budget Expended	.01%

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QUARTERLY PROGRESS REPORT

Project Title:	Operational Improvements at Traffic Circles (Project 2002-16)
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor
TASK ORDER NUMBER/Study Number: 129 / 4-26544	PRINCIPAL INVESTIGATOR: Kaan Ozbay (Rutgers) / George List (RPI)
Study Start Date: 01/01/2002 Study End Date: 12/31/2004	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Phase 1: Preliminary Literature Search	5%	50%	100%	5%
Phase 2				
Task 1: Literature Review	10%	25%	100%	10%
Task 2: Selection and Use of Computer Tool.	10%	100%	100%	10%
Task 3: Evaluation of Operational Alternatives.	30%	25%	50%	15%
Task 4: Safety Evaluation	20%	10%	20%	4%
Task 5: Cost – Benefit Analysis	10%	30%	30%	3%
Tasks 6: Final Recommendations	5%			
Tasks 7: Administration / Final Report.	10%	20%	20%	2%
TOTAL				49%

1. Progress this quarter by task:

- Task 1: This Task is complete. As part of this task, we also reviewed the following topics:
  - Available simulation models that can be used for the modeling o traffic cicrles
  - Related studies published in the open literature
  - Papers dealing wit Operation improvement applicable to traffic cicles
  - Data needs for the validation and calibration of traffic simulation model to be used to model the selected circles
  - Safety Issues
- Task 2: This Task is Complete
- Task 3: We completed the first phase of data collection at, Collingwood and Asbury Circles
- .Below a summary of our efforts in this quarter:
- Data extraction is completed for the Collingwood traffic circle. The extracted data include (i) vehicle counts at every 15 minutes with percentage of trucks and passenger cars, (ii) vehicle inter-arrival times, (iii) vehicle queue wait time before yield signs, (iv) vehicle wait times at yield signs, (v) gap acceptance/rejection times at yield signs.
- Same data extraction work for Asbury circle will be completed by the end of March, 2004.
- The PARAMICS model for the circle has been modified based on the traffic counts extracted from the data. Traffic signals have been added to the circle based on the signal timings provided by NJDOT.

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- Also using the API feature of PARAMICS, we have modified the vehicle gap acceptance functionbased on the extracted data. This modification resulted in more realistic traffic characteristics.
- Task 4: RPI team has submitted a technical memo, which explains their approach in assessing the safety improvements in the circle.
- RPI Team has also started analyzing the existing accident data.
- Task 5: A memorandum for the Cost-Benefit analysis is being prepared and will be discussed at the quarterly report meeting.

2. Proposed activities for next quarter by task
   - On 02/25/2004, Rutgers and RPI had a conference call to discuss the next step for the project. Based on this conference, it has been decided that the following list is needed for next steps: (i) Accident data for Collingwood and Brooklawn circles. The data for Collingwood is especially important for RPI team to complete with their analysis. (ii) Traffic data collection will be performed for Brooklawn circle in the first week of April. (iii) If available, the turning counts at the junctions in the vicinity of the circles are required for the simulation models.
   - Continue data processing and analysis
   - Continue calibration of simulation models

3. List of deliverables provided in this quarter by task (product date)

4. Progress on Implementation and Training Activities

5. Problems/Proposed Solutions
   We are still waiting for the rest of the accident data.

Total Project Budget	$ 422,524
Modified Contract Amount:	
Total Project Expenditure to date	$142,157
% of Total Project Budget Expended	34%

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QUARTERLY PROGRESS REPORT

Project Title:	Seismic Analysis of Retaining Walls, Buried Structures, Embankments, and Integral Abutments
RFP NUMBER: 2000-25	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel
TASK ORDER NUMBER: 127 / 4-26995	PRINCIPAL INVESTIGATOR: Dr. Husam Najm
Project Starting Date: 01/01/2003 **Original** Project Ending Date: : 12/31/2003 **Modified Completion Date:** : 12/31/2004	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Review on Seismic Design of Abutments, Retaining Structures, Buried Structures, and Embankments	10	5	85	9
2. Provide Analysis, Design, and Detailing of Free Standing Abut and Retaining Walls	20	10	60	12
3. Provide Analysis, Design, and Detailing of Integral (Diaphragm) Abutments	20	10	60	12
4. Provide Guide Specifications Manual to assist Designers in Designing Free-Standing and Integral Abutments, Embankments, Buried Structures and Retaining Walls	30	20	60	18
5. Prepare Progress reports	10	10	50	5
6. Final Report and Technical Memos	10	10	50	5
TOTAL	100%	13	61	61

Project Objectives: 1) Perform comprehensive review of new seismic design guidelines proposed in NCHRP 12-49; 2) Provide guidelines for seismic design of seat types abutments, integral abutments, retaining walls, and buried structures; 3) Provide analysis, design, procedures of these structures with examples based on new provisions; and 4) provide specifications for the seismic design of these structures in NJ consistent with new LRFD general seismic design criteria

Project Abstract: Current LRFD provisions are based on seismic design criteria and detailing provisions that are at least 10 to 20 years old. These provisions are mostly based on the Division I-A Seismic Design of the AASHTO Standard Specifications (1996) and NEHRP (1997). NCHRP Project 12-49 was initiated to address the inadequate performance of highway bridges in recent earthquakes and the deficiencies in the current seismic code. NCHRP Project 12-49 is intended to develop comprehensive specifications for seismic design of bridges considering all aspects of the design process including: (1) design philosophy and performance criteria, (2) seismic loads and site effects, (3) analysis and modeling, (4) design requirements, and (5) detailing. These new specifications will be nationally applicable with provisions for all seismic zones. In the area of foundation design, the NCHRP 12-49 provisions are essentially an update of the existing AASHTO LRFD provisions, incorporating both current practice and recent research results including additional specific guidance on spring constants for spread footings, deep foundations, and integral abutments. Because of the several significant changes in the design criteria and approach provided in the new provisions, there are questions on how these new provisions will affect the design and performance of bridge in states nationwide as well as the retrofit of existing bridges. There are also questions on the impact of new provisions on the design of abutments and retaining walls. Hence, there was a need to evaluate the impact of the new seismic design provisions proposed in NCHRP Report 12-49 on the seismic design and detailing of bridges in New Jersey. Two examples will be designed based on the new NCHRP provisions. Soil factors will be

evaluated and compared to current data base of site-specific spectra, and guide specifications for seismic design of bridges and buried structures in NJ will be developed consistent with the new guidelines.

1. Progress this quarter by task: started to collect data on site-specific response spectra from consultants in the NJ/NY metro area and making comparisons with NCHRP guidelines for NJ. A draft is completed for design procedures and design aids for typical two or three span bridges under seismic loads based on the NCHRP guidelines. A draft is completed on the seismic design of buried structures. The data is basically is a collection of current practices for the design of these structures for seismic forces.

2. Proposed activities for next quarter by task: Continue to collect response spectra data and continue on working to compare collected spectra versus those predicted by NCHRP 12-49. Continue to finalize those design aids for typical bridges based on SDAP C. PB will have a draft of their design examples with details and guidelines.

3. List of deliverables provided in this quarter by task (product date): Draft of design aids for SDAP C; Draft of design guidelines for tunnels and buried structures.

4. Progress on Implementation and Training Activities: Preparing a journal paper for the ASCE JBE (Journal of Bridge Engineering on design guidelines for SDAP C, which is applicable for most bridges.

5. Problems/Proposed Solutions:

Total Project Budget	$173,017
Modified Contract Amount:	
Total Project Expenditure to date	$101,932
% of Total Project Budget Expended	59%

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QUARTERLY PROGRESS REPORT

Project Title:	Material Characterization and Seasonal Variation in Material Properties
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Tony Chmiel
TASK ORDER NUMBER: Task Order No. 100 / 4-26701	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski
Project Starting Date: 01/01/2001 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Selection of Test Sections	5	0	100	5
Field Testing & Instrumentation	50	5	100	50
Analysis	35	10	65	23
Reporting	10	5	45	4.5
TOTAL	100%			82.5

Project Objectives:

The main objective of this study is to calibrate the AASHTO temperature and seasonal adjustment models, or to develop new models. These models will be based on New Jersey conditions and will be used in network and project level FWD analysis.

Project Abstract:

This study is being conducted to calibrate the AASHTO models, or to develop new models, for temperature and seasonal adjustment to suit New Jersey conditions. These models will be used in the network and project level FWD analysis. To achieve the objective of study, twenty-four pavement sections were instrumented and nondestructive testing (NDT) program is being conducted for a period of two years. The main task of the instrumentation is to monitor environmental parameters: air and pavement temperature, moisture, frost/thaw depth and rainfall. Seismic Pavement Analyzer (SPA) and Falling Weight Deflectometer (FWD) are used to evaluate the pavement structural response and its properties on a monthly basis, except during the spring thaw period when it is on a bi-monthly basis. The models will be developed by performing statistical analyses, such as analysis of variance (ANOVA) and regression analysis.

1. Progress this quarter by task:

The FWD Testing and Climatic data collection at the instrumented LTPP and non-LTPP sites and corresponding office processing continued during the reporting period.

1. The FWD and SPA testing proceeded as scheduled.
2. Climatic Data was collected for all the LTPP and Non-LTPP sites.
3. Processing of FWD and SPA data for the reporting period is in progress.
4. A correlation analysis is being carried out.

2. Proposed activities for next quarter by task:

- Continue analysis on environmental, FWD and SPA data.
- Continue with model development.

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:

N/A

5. Problems/Proposed Solutions:

N/A

Total Project Budget	$1,779,642.00
Modified Contract Amount:	
Total Project Expenditure to date	$1,449,553
% of Total Project Budget Expended	81%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Rut Testing of Hot Mix Asphalt
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Nicholas Vitillo
TASK ORDER NUMBER/Study Number: Task Order No. 98 / 4-26677	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 1/01/2003 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search/Local Agency Survey	10%	0%	100%	10%
Lab Testing for Rutting Criteria	25%	0%	100%	25%
Lab Testing for NJ HMA Characterization	25%	10%	100%	25%
Lab Testing for SUPERPAVE vs Marshall	20%	15%	100%	20%
Field Calibration/Evaluation	10%	55%	100%	10%
Final Report	10%	25%	100%	10%
TOTAL	100%			100%

Project Objectives:

- Select 4 pavement surfaces on New Jersey low volume roads that are performing well (and have performed well for a number of years) and are designed using the Marshall design process
- Obtain the original job mix formula for each location, sample materials from the identical material source, and conduct the Marshall design in the laboratory to compare to the JMF
- Using the identical materials, perform the Superpave design process and compare the volumetric results to the Marshall design values
- Test both design samples under the Asphalt Pavement Analyzer (APA) and permeability
- Determine the appropriate number of design gyrations needed by the Superpave design method to provide identical volumetric properties as the Marshall design

Project Abstract:

Currently, local aide utilizes the Marshall design for HMA materials on local roads. However, by 2005, the NJDOT will not provide specification for Marshall design, only for Superpave design, thus simplifying both the testing specifications and the design books at the suppliers. Unfortunately, many local aide engineers are resisting the move to Superpave because they feel it may be too complicated and not provide the same performance as the time test Marshall mixes.

The research was to evaluate four Marshall mixes that are performing well in the field and evaluate them under the Superpave design methodology. Volumetric analysis and performance testing were also conducted to evaluate if differences exist between the two mixes. The end result of the work being a document that the local aide can use to illustrate that only minor to no differences exist between the two design methodologies when designing low volume roads.

1. Progress this quarter by task:

The final report has been generated and will be delivered to the NJDOT at the March 2004 quarterly meeting. Results of the testing showed that only minor differences existed between the two different design methodologies. A statistical analysis was conducted to determine which volumetric/material property provided the best correlation to the needed number of gyrations to establish Marshall volumetrics. The testing concluded that the

bulk gravity of the aggregate blend provided the best correlation. However, it should be noted that only a limited number of data points existed.

2. Proposed activities for next quarter by task:
N.A.

3. List of deliverables provided in this quarter by task (product date):
N.A.

4. Progress on Implementation and Training Activities:
N.A.

5. Problems/Proposed Solutions:
N.A.

Total Project Budget	$391,867.00
Modified Contract Amount:	
Total Project Expenditure to date	$390,810
% of Total Project Budget Expended	100%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Ride Quality Follow-Up
RFP NUMBER: 2002-23	NJDOT RESEARCH PROJECT MANAGER: Mr. Nick Vitillo
TASK ORDER NUMBER: 126 / 4-26526	PRINCIPAL INVESTIGATOR: Dr. Nenad Gucunski
Project Starting Date: 1/01/2003 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search and Planning	5	0	100	5
1. Design and Development	70	20	60	42
2. Implementation and Training	10	0	0	0
Final Report	10	0	0	0
TOTAL	100%			47

Project Objectives:

- Selection of a Standard Pavement Profiler (SPP), which will be used as NJDOT's official and standard device to establish the "true" pavement profile for calibration purposes,
- Replacing the currently used Percent Defective Length (%DL) statistic with a more representative ride statistic in calculating bonuses and penalties for contractors, and in representing the user opinion.
- Tabulating equipment characteristics of selected profile measuring devices,
- Developing procedures for calibrating NJDOT's ARAN device and selected profiling devices for use by contractors for quality control,
- Developing procedures for correlating the NJDOT SPP, the NJDOT ARAN and other profilers for QA/QC purposes,
- Development or evaluation of a standard software which will be used to process file data for calculation of accepted ride statistic for use on new and rehabilitated pavement projects, and
- Comparison, verification and testing the software with output from the profile equipment manufacturer.

Project Abstract:

This project is a follow-up of a study conducted by NJDOT Bureau of Research to evaluate the applicability of using automated highway profilers to replace the Rolling Straightedges (RSE) currently used by NJDOT to implement the department's smoothness specifications. The study recommended that NJDOT select an automated profiler to replace the RSE as its official and standard smoothness measuring equipment, and correlation models developed to calibrate other profilers with the standard profiler. It was recommended to select an indicator that better represents ride statistic as compared to using %DL or IRI.

The present project is aimed for carrying out further research to develop new acceptance specifications for improving QA/QC practice of evaluating pavement smoothness. This will involve replacing the presently used RSE device with a standard automated highway profiler and the use of a new ride statistic, which gives better representation of the actual pavement smoothness. The new statistic can then be used for calculating contractor bonuses and penalties as opposed to the current practice of using %DL.

The approach undertaken in the previous RSE study is being implemented in the present project. The project will be completed in four phases:

- Phase I (Literature Search and Planning) involves a comprehensive literature review, and presentation of findings to RPSIP for discussions and comments. Changes to the proposed work plan based on comments received will be made if required.
- Phase II (Design and Development) involves field data collection for selection of the standard pavement profiler (SPP), analysis of data for calibration and correlation of selected profilers and ARAN using SPP, development of a more representative ride statistic and software development or evaluation of existing software packages.
- Phase III (Implementation and Training) involves presentation of the findings of the research study, its implementation and for training in the use/operation of the correlation and calibration procedure and software developed as part of this study.
- In Phase IV (Reporting) the Final Report and Technical Brief will be submitted for review and comments by the RPSIP. If appropriate, a Research Needs Statement will be produced as a deliverable. This would identify the need for, and the scope of, further study and evaluation of the selected NJDOT Standard Pavement Profiler.

1. Progress this quarter by task:
   - Testing with Walking Profiler on I-195 is complete for two sections and Rod and Level survey is complete for only one section. Due to safety concerns, only three sections will be tested.
   - Preliminary analysis on I-195 data, show good correlation between WP and Rod and Level.
   - Selection of an additional site in the relatively rough category.
   - Development of alternative ways for pavement smoothness description (i.e. wavelet transforms) by considering the following factors:
     - Detection of repeated waves of wavelength affecting the ride quality,
     - Effects of the type and speed of the vehicle on user opinion,
     - Effects of roughness on the magnitude of dynamic forces induced on the pavement and cause damage, etc.

2. Proposed activities for next quarter by task:
   - Testing with ICC Laser Profilometer and Dynatest Road Surface Profiler
   - Development of a more representative ride statistics for use on new and rehabilitated pavement projects
   - Software review and evaluation, software development

3. List of deliverables provided in this quarter by task (product date):

4. Progress on Implementation and Training Activities:
   N/A

5. Problems/Proposed Solutions:
   N/A

Total Project Budget	$310,487
Modified Contract Amount:	
Total Project Expenditure to date	$55,324
% of Total Project Budget Expended	18%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Evaluation of Poisson's Ratio
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel
TASK ORDER NUMBER/Study Number: Task Order No. 128 / 4-26531	PRINCIPAL INVESTIGATOR: Thomas Bennert
Project Starting Date: 1/01/2004 **Original** Project Ending Date: 12/31/2005 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search/Sensitivity Analysis	10%	50%	100%	10%
1. Material Collection	5%	0%	100%	5%
2. Laboratory Testing	65%	20%	40%	26%
3. Calibration	10%	25%	25%	2.5%
4. Reporting	10%	0%	0%	0%
Final Report				
TOTAL	100%			43.5%

Project Objectives:

- Conduct a sensitivity analysis to evaluate how the changing of the Poisson's Ratio affects the stresses and strains determined using elastic layer analysis procedures
- Evaluate the measurement of the Poisson's Ratio for aggregate base materials during the resilient modulus test and compare to available prediction equations
- Evaluate the measurement of the Poisson's Ratio for HMA materials during the dynamic modulus test and compare to available prediction equations

Project Abstract:

For the upcoming AASHTO Mechanistic Design Guide, the two main parameters needed for predicting the pavement stresses and strains are the modulus and the Poisson's Ratio. At the moment, the Poisson's Ratio is estimated based on the modulus of the material (both aggregate and HMA) or by the HMA temperature. However, this was developed using a minimal amount of material that does not represent the commonly used materials of New Jersey. Therefore, a research effort was developed to evaluate the current prediction methods and, if applicable, modify them to provide values that more closely represent materials from New Jersey.

1. Progress this quarter by task:

Difficulties with the LVDT system for the aggregate testing caused the testing to be shifted to the HMA materials. The HMA materials were instrumented with three vertical LVDT's and a circumferential LVDT. Three HMA mixes were evaluated, 12.5mm coarse Superpave mix with a PG64. 70, and 76-22 asphalt binder. Testing showed that the Poisson's Ratio did change with modulus, however, not as drastic as that recommended by the NCHRP researchers. The Poisson's Ratio only increased with increasing temperature, a trend that was also recommended by the NCHRP researchers.

2. Proposed activities for next quarter by task:

Further testing of HMA samples will take place this quarter using different gradations. The testing method will also be further evaluated to try to explain the discrepancies between the results here and those recommended by the NCHRP researchers.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:
N.A.

5. Problems/Proposed Solutions:
N.A.

Total Project Budget	$426,111
Modified Contract Amount:	
Total Project Expenditure to date	$150.649
% of Total Project Budget Expended	35%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Use of Windows-based PDAs for Paperless Operation of Emergency Management Team
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Stan Worocz
TASK ORDER NUMBER: Task Order No. 138/4-29091	PRINCIPAL INVESTIGATOR: Dr. Trefor Williams/Dr. Izzat Bakhadyrov/Joe Orth
Project Starting Date: 12/15/2003 **Original** Project Ending Date: 12/15/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Technology Review	10	90	100	10
2. Specifications				
2.01 Business Requirements	10	80	90	9
2.02 Functional Requirements	5			
2.03 Design Specifications	5			
3. Coding and Development	30			
4. Debugging	10			
5. On-Field Testing	10			
6. Training	10			
7 Deployment	10			
TOTAL	100%			19%

Project Objectives: To research and develop a paperless data collection system for New Jersey Traffic Operations South's Emergency Service Program and provide application software to transfer field collected incident data to the central database of New Jersey DOT Operations.

Project Abstract: The New Jersey Department of Transportation (NJDOT) Operations has an immediate need for efficient paperless case data entry solutions for their Emergency Service Providers (ESP's) personnel. The ESP personnel patrol designated areas throughout the State for the purpose of performing emergency services for motorists encountering minor and major accidents or incidents. At each accident scene or incident, a case description form is filled out by the ESP team, which includes data on motorist vital information, road conditions, etc. Currently, the form that is used by the ESP team is paper-based and is submitted at the end of the work shift. The data entry operator then enters this information into the central database, where the information is collected for further analysis. The use of paper forms creates an unnecessary workload for database operators. Also, this substantial number of forms (about 400/day) exceeds the data entry capabilities of the departmental database operators, thus creating significant backlogs and delays.

This project will be divided into three main stages:

I. **Environment and Technology Research.** At this stage, NJDOT Operations ESP structures (organizational, geographical, information, etc.) will be studied along with the survey of current state-of-the art in PDA technology. The PDA-based system will be developed from the results of investigations, surveys, field reviews, and departmental recommendations regarding the improvement of existing operational and information exchange procedures. Additionally, the findings will be further adapted to the detailed specifications of hardware and software for PDA system.

II. **Development.** At this stage, custom PDA and server software will be developed, based on requirements produced in Stage I. A Pilot program, involving 1-3 PDA's will be executed with select ESP team members to test the efficiency of the developed system and improve it, if necessary.

III. **Deployment and Training.** Upon completion of Stage II. ESP incident reporting will be migrated to the new PDA-based paperless system. Training will be provided to ESPs in order to demonstrate the use the PDA-based system. Optionally, training will be provided to designated personnel who are responsible for the maintenance and troubleshooting of the PDA-based system, as it interfaces with the central server.

Development of this hardware/software solution will utilize Windows-based PDAs to enter and store ESP incident forms in an electronic format. This will dramatically reduce the workload for database operators and provide a paperless operation for ESP personnel. This system would include the capability of easy submission of forms directly or indirectly into the central database, thus increasing the efficiency of the Division and eliminating the manual entry of information into the central database.

1. Progress this quarter by task:

1. Technology Review completed
2.01 Information gathered for Business Requirements

2. Proposed activities for next quarter by task:

2.01.1 Write Business Requirements
2.01.2 Review Business Requirements with NJDOT Project Team
2.01.3 Revise/Rewrite Business Requirements as necessary
2.02 Develop Functional Specifications based on results of task 2.01
2.03 Develop Design Specifications
3. Begin Coding and Development
4. Begin Debugging

3. List of deliverables provided in this quarter by task (product date):

1. Submitted Report on Technology Review February 26, 2004)
Overall: Published Project Timeline (February 26, 2004)

4. Progress on Implementation and Training Activities:

Not at implementation

5. Problems/Proposed Solutions:

None at this time

Total Project Budget	$98,395.00
Modified Contract Amount:	98395.00
Total Project Expenditure to date	$190.54
% of Total Project Budget Expended	.19%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Demonstration Project – The Measurement of Pavement Noise Using the NCAT Noise Trailer
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Lad Szalaj
TASK ORDER NUMBER: 140 / 4-29052	PRINCIPAL INVESTIGATOR: Thomas Bennert
Project Starting Date: 8/1/2003 **Original** Project Ending Date: 3/31/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Pavement Type Selection	10%	100%	100%	10%
2. Pavement Noise Testing	70%	100%	100%	70%
3. Data Analysis and Reporting	20%	100%	100%	20%
Final Report				
TOTAL	100%			100%

Project Objectives:

- To evaluate the use of the NCAT Noise Trailer as a means of providing repeatability values of tire/pavement related noise
- To provide the NJDOT with an initial database of typical tire/pavement noise for different pavement surfaces in New Jersey
- To evaluate the affect of vehicle speed on the magnitude of tire/pavement related noise

Project Abstract:

A demonstration project was conducted for the New Jersey Department of Transportation (NJDOT) to evaluate the measurement of pavement/tire noise on New Jersey pavements. The pavement/tire noise is defined as the noise directly produced by the tire traveling over the pavement surface. It does not consider other traffic-related noise such as automobile/truck engines, braking, etc. This is important since the only factor the NJDOT can truly control to aid in the traffic noise reduction is the pavement surface.

The demonstration project was developed to provide two key pieces of information: 1) An evaluation of the NCAT Noise Trailer as a means of measuring pavement/tire related noise, and 2) To develop an initial database of noise values for different pavement surfaces that are typically encountered on New Jersey highways.
The NCAT (National Center for Asphalt Technology) Noise Trailer uses the Close-Proximity Method (CPX) to measure the pavement/tire noise. In this method, microphones are placed near the pavement/tire interface to directly measure the pavement/tire noise levels. The microphone set-up and tires are enclosed in a chamber that is insulated with noise absorbing insulation. This provides an enclosure that is only measuring the noise developed by the pavement/tire interface and not any external noise of the passing vehicles or environment.

The NCAT Noise Trailer was evaluated for repeatability and also to evaluate the effect of traffic speed on the pavement/tire noise. Results of the testing showed the repeatability to be quite consistent, with the average standard deviation to be 0.15 decibels, as long as the test section is greater than 0.1 miles. The standard deviation proved to increase when the test section was less than 0.1 miles, such as for bridge decks. The effect of traffic speed was evaluated by testing the same pavement section at three different speeds; 55, 60, and 65 mph. The results indicated that the 55 mph speed produced the lowest pavement/tire noise and that it can be assumed that the noise increases linearly (at least within this range of traffic speed).

The NCAT Noise Trailer was also used to develop an initial database of pavement/tire noise levels for different pavement surfaces tested. In general, the Portland Concrete (PCC) sections produced the loudest pavement surface while the Open-graded Friction Course (OGFC) produced the lowest pavement/tire noise.

1. Progress this quarter by task:

The project is completed and the final report has been generated. The report will be delivered to the NJDOT for the quarterly meeting in March.

2. Proposed activities for next quarter by task:

N.A.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Total Project Budget	$15,000
Modified Contract Amount:	
Total Project Expenditure to date	$13,127
% of Total Project Budget Expended	88%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	New Jersey State LTAP Technology Transfer Center
RFP NUMBER: 2004-	NJDOT RESEARCH PROJECT MANAGER: W. Lad Szalaj
TASK ORDER NUMBER: 149	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 01/01/2004 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Activity				
1. Compile and Maintain Mail List	1.88	65	65	1.17
2. Publish Monthly Newsletter	10.30	25	25	2.6
3. Distribute Technology Transfer Materials	15.45	20	20	3
4. Provide Technical Assistance	34.25	20	20	6.9
5. Provide Training	33.31	25	25	8.3
6. Evaluate Effectiveness of Program	4.81	12	12	.58
Final Report				
TOTAL	100			23.27

Project Objectives:

The Local Technical Assistance Program (LTAP) seeks to conduct several tasks that will promote best practices and implement state-of-the-art technologies to county and municipal transportation agencies. These activities include training, materials distribution, newsletter publication, technical assistance, and program evaluation. The objectives of this project are to continue to diversify and expand the customer base, deliver quality customer service, communicate the program values to partners and clients, and enhance the technology transfer network, through the activities of the Local Technical Assistance Program (LTAP).

Project Abstract:

The Local Technical Assistance Program (LTAP) will maintain mailing lists, publish a monthly newsletter, provide technical assistance, provide training, and evaluate the effectiveness of the program on an ongoing basis throughout the project.

The anticipated results are the creation of a library special collection made available on the LTAP website, monthly newsletter publication, an updated fax/e-mail directory for the transportation field, expanded training programs and additional conferences, and increased involvement with pertinent professional organizations.

1. Progress this quarter by task:

A. Compile and Maintain Mail List

The mail list database software was changed during this quarter from Winfax to FAXmaker. This change was made so that database use would be more reliable for tracking incoming and outgoing faxing for brochures. The new software, FAXmaker, also enables a more user-friendly capability for converting the database into traditional mailing labels.

The mail list was updated to include the 2003-2004 National Association of County Engineers (NACE) Membership Directory. This directory is comprised of 1,813 individual entries.

B. Publish Monthly Newsletter

Approximately 3,600 individuals received each issue of the newsletter. Three issues of the newsletter were produced during this quarter. Electronic distribution of the newsletter occurred via e-mail. The newsletter is also available on the LTAP webpage: www.ltap.rutgers.edu and previous issues are archived in the "newsletter" section of the webpage: http://www.ltap.rutgers.edu/newsletter/ .

Volume 6, Number 1 was published in January 2004. The first edition of the year featured articles on Engineers Week for 2004, New Jersey Governor James McGreevey's 2nd Transportation Conference, a research project spotlight on the replacement of rolling straightedge devices for grounds maintenance, changes in traffic control devices to aide older drivers; an updated events calendar, and several training announcements. The month's *Free for the Asking* offering was *Speed Management Resources*, published by the Federal Highway Administration.

Volume 6, Number 2 was published in February 2004. This issue featured articles on 2005 federal funding for public works programs, the groundbreaking for the Center for Advanced Infrastructure and Transportation (CAIT), a research project spotlight on *Rut Testing of Hot Mix Asphalt*, an events calendar, training announcements and an introduction to the Federal Highway Administration's Research and Technology website. This month's *Free for the Asking* offering was *Traffic Control Handbook for Mobile Operations at Night*, published by the Federal Highway Administration Office of Safety.

Volume 6, Number 3 was published in March 2004. The third issue of the quarter contained several conference announcements, updated training calendars, upcoming events, and articles on the United States Senate debate over SAFETEA and GIS in transportation. The *Free for the Asking* offering was *Geographic Information Systems: a Tool for Improving Community Livability*, published by the Federal Highway Administration.

C. Distribute Technology Transfer Materials

554 technical publications were distributed during this quarter. Technology transfer materials were distributed during training seminars, workshops, and F*ree for the Asking* requests via the newsletter. In addition, specific requests made by customers included training videos and technical publications, which were duplicated and distributed.

D. Provide Technical Assistance

There were 310 instances of technical assistance provided by the LTAP staff. Requests were received via telephone, e-mail, mail, and fax.

E. Provide Training

Training has occurred this quarter in the following program areas: Municipal Engineering Construction Inspection Part One, Municipal Engineering Construction Inspection Part Two, Road Scholar One, Crew Supervisors Academy and one traffic engineering seminar. During this quarter, 295 individuals were trained via 13 programs.

F. Evaluate Effectiveness of Program

Program effectiveness was measured by use of course evaluations completed by participants at the end of each training program. Participants were asked to rate the overall quality of the course content, instructor, and presentation of the materials. Participants consistently rated the programs as having met or exceeded their expectations.

2. Proposed activities for next quarter by task:

A. Compile and Maintain Mail List

The mail list will be updated on an as needed basis.

B. Publish Monthly Newsletter

The newsletter will remain on a monthly publishing schedule.

C. Distribute Technology Transfer Materials

Technology transfer materials will be distributed during training programs, at the Annual Asphalt Paving Conference and the Annual New Jersey Public Works Trade Show (April 2004), and by request.

The lending library is always available.

D. Provide Technical Assistance

Technical assistance will be provided in response to any inquiries made via telephone, fax, or e-mail.

E. Provide Training

Training programs are scheduled for the next quarter as follows:

Road Scholar One Program
- Personal Injury Prevention Techniques
- Worker and Equipment Safety
- Confined Space and Excavation Rescue
- Excavation and Trenching Safety
- Effective Incident Documentation
- Hazard Communications and Awareness
- Winter Maintenance
- Preventive Maintenance

Hot Mix Asphalt Resurfacing
Low Cost Surface Rehabilitation

Road Scholar Two Program
- Grant Writing
- Shared Services and Privatization
- Managing Public Equipment
- Successful Budgeting for Municipal Governments
- Superpave
- Crack Seal Repair

Conferences and Seminars
- Preparing for and Responding to Terrorism and Weapons of Mass Destruction
- Asset Management for Public Works Departments
- National Moveable Bridge Seminar
- Incident Command System for Public Works

Public Works Academy
- Burlington County
- Monmouth County

F. Evaluate Effectiveness of Program

Evaluations will continue to be distributed at each program. An Advisory Committee meeting will be held to review the project activities and progress.

3. List of deliverables provided in this quarter by task (product date):

A. Compile and Maintain Mail List

Software change	February 2004
NACE Database	February 2004

B. Publish Monthly Newsletter

Volume 6, Number 1	January 2004
Volume 6, Number 2	February 2004
Volume 6, Number 3	March 2004

C. Distribute Technology Transfer Materials	Ongoing
D. Provide Technical Assistance	Ongoing

E. Provide Training

Asphalt Plant Technician Level I Training	January 8,9,15,16,22, & 23, 2004
Municipal Engineering Construction Inspection Part One	January 14, 21, & 28, 2004
Municipal Engineering Construction Inspection Part Two	February 4, 11, & 18, 2004
Superpave Certification	February 12,13,19, & 20, 2004
Current Trends in GIS Applications for Traffic Engineers	February 19, 2004
Municipal Engineering Construction Inspection Part One	February 25, March 3, & 10, 2004
Flagging Techniques and Procedures	March 15, 2004

Crew Supervisors Academy	March 15-19, 2004
Municipal Engineering Construction Inspection Part Two	March 17, 24, & 31, 2004
Hazards Associated with Fertilizers, Insecticides, and Herbicides	March 23, 2004
Grounds Maintenance Safety	March 23, 2004
Drainage Maintenance: The Key to Roads that Last	March 30, 2004
Asphalt Roads: Common Maintenance Problems	March 30, 2004
F. Evaluate Effectiveness of Program	Ongoing

4. Progress on Implementation and Training Activities:

All of the activities of this technology transfer project, and their implementation dates are included above.

5. Problems/Proposed Solutions:

One course (originally to be January 27-29,2004) has been re-scheduled due to inclement weather; Incident Command System for Public Works is now scheduled for April 6-8, 2004.

An error within NJDOT accounting has delayed the process of issuing the Task Order for this project. Rutgers University is awaiting the initial contract for signature.

Total Project Budget	415,000
Modified Contract Amount:	
Total Project Expenditure to date	$29,612
% of Total Project Budget Expended	7.2%

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate project accounting please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The New Jersey Local Police Technical Assistance Program
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Pat Ott
TASK ORDER NUMBER/Study Number: Task Order No. 143/ RU Hold Account	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg
Study Start Date: December 1, 2003 Study End Date: December 1, 2005	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.0 Literature Search	20	0	0	0
1.1 Conduct research	10	0	35	3.5
2.0 Survey	5	10	10	.5
2.1 Conduct Survey	5	10	10	.5
3.0 Technical Assistance/Tech Transfer	10	0	0	0
3.1 Maintain Mail Lists	5	0	25	1.25
3.2 Publish Newsletter	10	0	0	0
3.3 Provide Technical Assistance	15	0	10	1.5
4.0 Provide Training	20	0	0	0
TOTAL	100			7.25 %

Project Objectives: The Police Technical Assistance Program (PTAP) is responsible for the following:

1. To provide a clearinghouse for law enforcement agencies to access information on advancements being made in the crash records field.
2. To showcase NJDOT methodologies, research, and technology initiatives in crash records systems.
3. To offer technical assistance to Local police departments.
4. To support the NJDOT's goal of reaching local government agencies through CAIT-LTAP technology transfer activities.

Project Abstract: There is a need for the FHWA vital few strategic goals to be introduced to local government through training outreach and distribution of resources. Accurate reporting, processing, and maintaining of crash data is a priority for NJDOT to develop effective solutions to traffic safety problems. Staff members of the NJ LTAP program will serve as representatives to the Safety Management Task Force and the Statewide Traffic Records Coordinating Committee (STRCC). Additionally, the LTAP staff members will facilitate quarterly local task force meetings for representatives from local law enforcement associations. The outcome of this program is to increase the accuracy of crash reports that are submitted to the NJDOT for inclusion in the statewide Crash Records Database.

1. **Progress this quarter by task:**

Task	Description
2.0 Survey	Police Traffic Officers have been responding to the NJTR-1 Survey on the availability of electronic data transfer.
2.1 Conduct Survey	CAIT-LTAP has received survey responses from Police Traffic Officers on Municipal Roadway Safety conditions.

2. **Proposed activities for next quarter by task:**

Task	Proposed Activities
1.0 Literature Search	The Literature Search will be focused on the best practices that exist on establishing crash records data collection systems.
1.1 Conduct Research	Rutgers will contact other states to determine the best practices for data collection and sharing of databases between state and local enforcement agencies.

3. **List of deliverables provided in this quarter by task (product date):**

Task	Description	Item/Date
2.0 Survey	Police Traffic Officers have been responding to the CSSI Survey on the local use of crash data	Over 170 surveys have been obtained from predominantly police traffic officers during the period of (1/1-2/20/04).
2.1 Conduct Survey	CAIT-LTAP has received survey responses from Police Traffic Officers on Municipal Roadway Safety conditions.	Over 170 surveys have been obtained from predominantly police traffic officers during the period of (1/1-2/20/04).

4. **Progress on Implementation and Training Activities:**

Training	Description
4.0 Provide Training	The NJTR-1 Committee will not be completed with the task of revising the form until late 2004, which means that workshops and program updates will not available until the beginning of 2005.

5. **Problems/Proposed Solutions:** The PTAP grant may need to be extended another year, reflecting January 1 through December 31st, so that training on the NJTR-1 revisions can be conducted. The project manager has recently been hired to administer this project and will conduct the appropriate grant activities.

Total Project Budget	$285,725.00
Modified Contract Amount:	
Total Project Expenditure to date	0
% of Total Project Budget Expended	0

* These are approximate expended amounts for the project; these estimates are for reference only and should not be used for official accounting purposes. For a more accurate accounting, please review the quarterly invoice for this project.

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Use of LED or Other New Technology to Replace Standard Overhead & Sign Lighting
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath
TASK ORDER NUMBER: 148 / 4-29090	PRINCIPAL INVESTIGATOR: Pat Szary
Project Starting Date: 1/1/2004 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	100%	100%	5%
1. Comprehensive Literature Review	20%	30%	30%	6%
2. Develop a Cost Benefit Model	30%	0%	0%	0%
3. Experimental Process & Implementation	25%	0%	0%	0%
4.Analysis of Experimental Data	15%	0%	0%	0%
Final Report	5%	0%	0%	0%
TOTAL	100%			11%

Project Objectives:

The goal of this study is to provide NJDOT with information concerning the replacement of standard overhead and sign lighting with LED or new technology. The study should meet four basic objectives:

1. Reduce operating costs while upholding the quality of the roadway environment, in relationship to nighttime visibility.
2. Provide NJDOT with the information such that they can substitute out-of- date technology with newer, more efficient lighting equipment such as sulfur light, bright white LED light, QL lighting, and other technologies.
3. Supply NJDOT with a lighting plan that is able to offer equal or better illumination with significantly lower energy consumption and cost.
4. Establish a lamp replacement, cleaning, and equipment maintenance schedules that ensure quality lighting while enabling NJDOT maintenance staff to focus on higher priority tasks.

Project Abstract:

The research team will gather information on existing bulbs and hardware commonly used by NJDOT. This information will help to establish a baseline for the cost/benefit analysis. This study will include systems such as overhead street lamps and roadside signboards that are illuminated. A comparison will be made between the different lighting technologies presently used as well as those identified in the literature search that may not yet be mainstream. All bulbs will be compared in a performance test to determine their respective efficiencies. Bulb recommendations will be made after analyzing results on specific criteria (power consumption, illumination, durability, bulb life, etc.) The data collected in the research phase of the study will be compared to that found in the literature review, to assist in the verification and evaluation of experimental results. Bulb comparison is discussed in more detail as part of the Phase II section of this proposal. The overall testing procedures for the bulbs will be determined as a part of Task 2, thus addressing any special problems specific to individual technologies.

1. Progress this quarter by task:

- Initial literature search is underway, we have requested specs from Caltrans and Connecticut DOT as well as making the appropriate contacts for future reference.

- We met with a Philips Technical Engineer and discussed the different types of technology that could be a direct replacement for existing technology as well as some other possibilities including complete retrofits (all new fixtures) for specific requirements/applications.
- Began the research and made initial industry contacts.
- Contacted one solar vendor for highway lights and sign lighting, the vendor agreed to set-up a demo for NJDOT in the maintenance yard (if this is something that NJDOT wants to pursue).

2. Proposed activities for next quarter by task:
   - Complete comprehensive literature search and deliver a short memorandum documenting our initial findings, approach, and feasibility/costs.
   - Complete a revised approach proposal to address NJDOT's current energy/efficiency/maintenance issues and to address specific concerns raised in meetings.
   - Complete research plan and begin implementation of such plan.

3. List of deliverables provided in this quarter by task (product date):
   - N.A.

4. Progress on Implementation and Training Activities:
   - N.A.

5. Problems/Proposed Solutions:
   - We wanted to set-up a meeting between the RU/CAIT research team and the NJDOT Ops Support to further refine the SOW and discuss specific problems in more detail. However, due to scheduling conflicts this meeting will take place in March instead of February as originally anticipated.

Total Project Budget	$146,000
Modified Contract Amount:	
Total Project Expenditure to date	0
% of Total Project Budget Expended	0%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Implementation of Weigh-In-Motion (WIM) Systems
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Nick Vitillo
TASK ORDER NUMBER: 92 / 4-23941	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Study Start Date: 06/14/2000 **Original** Study End Date: 12/31/2003 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	10%	0%	100%	10%
1. Packaging	17%	0%	100%	17%
2. Testing	14%	0%	100%	14%
3. Site Determination	11%	10%	100%	11%
4. Field Implementation & Calibration	16%	15%	85%	13.6%
5. Monitoring and Analysis	22%	0%	0%	0%
Final Report	10%	0%	0%	0%

1. Progress this quarter by task:
   A. The DAQ computer was returned to the vendor (this is the second time in the past few months that we had to send the unit back). They were to complete the agreed repair of the DAQ system. This service included free labor for the replacement of the motherboard, CPU and power supply.

   B. DAQ devices were transferred to an alternate computer to continue progress while the original DAQ computer was sent back to its vendor for servicing.

   C. More efficient code has been written for the governing DAQ computer program.
      1. The new code has fewer functions and is able to be processed faster, with less stress on the CPU.
      2. This code also has the potential to allow the DAQ system to function independently of a user. It would continuously acquire data but would only record and save an event.

   D. The DAQ computer card has installed and tested in the alternate computer system to verify its functionality. A sample block of asphalt with a piezoelectric sensor imbedded in it was used to generate a voltage potential in the same manner as the installed sensors would.

   E. The original DAQ computer has returned from the vendor and is being outfitted with the DAQ hardware and software

2. Proposed activities for next quarter by task:
   A. Monitoring of vehicles at site for initial samples of data.
   B. Collaborating with State Police to conduct a monitoring event at weighing station. This would allow data to be compared from both sources, as to complete final calibration of our unit.
3. List of deliverables provided in this quarter by task (product date):
   N/A
4. Progress on Implementation and Training Activities:
   N/A

5. Problems/Proposed Solutions:

Snow and low temperatures, have prevented us from initial field testing, as the temperature rises above freezing we anticipate being able to visit the site successfully collect data.

Total Project Budget	$194,500.00
Modified Contract Amount:	
Total Project Expenditure to date	$104,251
% of Total Project Budget Expended	54%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Development of Airport Obstruction Identification System
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath
TASK ORDER NUMBER: 115 / 4-26857	PRINCIPAL INVESTIGATOR: Patrick Szary
Project Starting Date: : 01/1/2002 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date:** 12/31/2004	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Search	10%	0%	100%	10%
2. Develop criteria	5%	0%	100%	5%
3. Evaluate the cost effectiveness	8%	0%	100%	8%
4. Conduct laboratory experiments	5%	0%	80%	4%
5. Conduct laboratory/field experiments	15%	10%	90%	13.5%
6. Develop prototype software	25%	20%	80%	20%
7. Demonstrate field test system	5%	30%	50%	2.5%
8. Redesign a new prototype	5%	30%	80%	4%
9. Demonstrate prototype system	5%	10%	10%	.5%
10. Train NJDOT personnel	7%	0%	50%	3.5%
11. Final Report	10%	0%	10%	1%
TOTAL	100%			72%

Project Objectives:

Project Abstract:

1. Progress this quarter by task:

A. The choice in GPS unit was revisited while attending the TRB Conference in Washington, D.C. The Leica GS20 was chosen to be a much better fit for the project and can be obtained at a substantially lower price than the previously specified GPS.
B. The Industrial Twin Helicopter has begun to undergo the installation of the mounts for the components of the system. This work is anticipated to take a few weeks to complete.
C. The airport selection process was visited to begin to determine a good facility for testing the system once the unit is complete.

2. Proposed activities for next quarter by task:

A. The completion of the integration of the Bergen Industrial Twin and outfitting the unit with all the necessary components for testing.
B. Completing the training of DOT personnel with a one-week intensive training session that is to take place.
C. Test flying the helicopter at the chosen airport and sending acquired images to Oakland University for post processing and producing a detailed map.

3. List of deliverables provided in this quarter by task (product date): n/a

4. Progress on Implementation and Training Activities:

Trainings sessions were conducted and have now been suspended due to weather as expected. Plans are being made for a full week training session when training resumes as the weather breaks.

5. Problems/Proposed Solutions:

The timeframe for the helicopter mount has taken slightly longer than expected and should be completed early next quarter if not by the end of the current quarter. Another problem has been the cold weather effecting the trainings, this was expected and as the weather improves trainings will resume.

Total Project Budget	$210,000.00
Modified Contract Amount:	
Total Project Expenditure to date	$109,372
% of Total Project Budget Expended	52%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Geopolymer Protective & Graffiti Resistant Coating (I-295 Scenic Overlook)

RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Robert Sasor
TASK ORDER NUMBER: 145/4-29065	PRINCIPAL INVESTIGATOR: P. Balaguru
Project Starting Date: 10/15/2003 **Original** Project Ending Date: 10/15/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	25%	50%	2.5%
1. Lab tests	25%	20%	50%	12.5%
2. Field implementation	60%	0%	1%	0%
Final Report	10%	0%	0%	0%
TOTAL	100%	0%	0%	15%

Project Objectives:

Project Abstract:

1. Progress this quarter by task: More coatings were made at the laboratory

2. Proposed activities for next quarter by task: Continue laboratory work

3. List of deliverables provided in this quarter by task (product date):N/A

4. Progress on Implementation and Training Activities: N/A

5. Problems/Proposed Solutions: None

Total Project Budget	$10,000
Modified Contract Amount:	
Total Project Expenditure to date	$357
% of Total Project Budget Expended	4%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The Future of Transportation Modeling
RFP NUMBER: NJDOT 2001-19	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker
TASK ORDER NUMBER: 117 / 4-26856	PRINCIPAL INVESTIGATOR: Maria Boilé
Project Starting Date: 01/01/2002 **Original** Project Ending Date: 12/31/2003 **Modified Completion Date: 8/31/2004**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Model comparison and summary matrix	25%	0%	100%	25%
2. Conduct survey	25%	10%	100%	25%
3. Plan to be followed by the Bureau of Technical Analysis	20%	30%	55%	11%
4. Implementation and Training	15%	25%	65%	9.75%
Final Report	15%	10%	70%	10.5%
TOTAL	100%			81.25%

Project Objectives:

The objectives of this study are to

(1) Determine the future trends and directions of practical travel demand models and processes over the next five years.
(2) Compare the next generation alternatives with the traditional modeling processes and programs in order to recommend which models and processes are likely to become the next standards.
(3) Provide staff training for the Bureau of Technical Analysis on the capabilities of the models which will be identified as the future industry standards and the requirements for transition to the new standards, from models currently used by the Bureau.

Project Abstract:

Careful planning will help avoid problems with severe traffic congestion, dangerous travel patterns, undesirable land use patterns, adverse environmental impact and wasteful use of money and resources. Planners need to implement the appropriate set of tools, which will help create high quality transportation services at a reasonable cost with minimal environmental impact and meet the requirements of ISTEA, TEA-21 and the CAAA. The scope of this project is to identify and assess the new trends in transportation modeling and assist the NJDOT Technical Analysis Bureau in making educated decisions regarding their future transportation modeling needs. For this purpose, a comparative evaluation of the available and under development transportation modeling tools will be performed and the advantages and disadvantages of each one will be discussed in detail and summarized in an easy to read matrix. Projections of future transportation modeling needs will be made and the capability of existing and under development tools to address these needs will be assessed. A comparative analysis of existing models will include among other, information on model capabilities, data requirements, user friendliness, cost, hardware, software and maintenance requirements.

1. Progress this quarter by task:

Task 2: Survey results have been summarized and a draft report with some preliminary findings has been produced. The report will be sent to the advisory board members for review.

Task 3: The plan to be followed by the Bureau of Technical Analysis if they wish to switch from their current models to others identified as future standards is being developed. Preliminary survey results have been considered in the current draft of the plan.
Task 4: The interactive tool has been revised to include the current version of the summary matrix information
Final Report: New information on survey results and modifications of the interactive tool have been addressed in the final report draft document.

2. Proposed activities for next quarter by task:
Task 3: Based on the comments that will be received from the advisory board and further analysis of the project findings, a near final draft of the plan to be followed by the Bureau of Technical Analysis if they wish to switch from their current models to others identified as future standards, will be produced.
Task 4: The final version of the interactive tool will be developed
Final Report: the current draft of the final report will be updated

3. List of deliverables provided in this quarter by task (product date):
None

4. Progress on Implementation and Training Activities:
Attempts to organize demo presentations by various software developers and/or vendors have not been successful as not enough interest has been generated within the Department. Upon completion of the project a presentation of the findings and recommendations, along with an overview of the features and capabilities of the various software packages that have been reviewed will be made.

5. Problems/Proposed Solutions:
None

Total Project Budget	$125,111
Modified Contract Amount:	
Total Project Expenditure to date	$67,353
% of Total Project Budget Expended	54%

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QUARTERLY PROGRESS REPORT

Project Title:	Engineering Management Consulting Services
RFP NUMBER: N/A	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Doreen Plummer
TASK ORDER NUMBER/Study Number: Task Order No. 124 / 4-26789	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Pat Szary
Project Starting Date: 5-29-03 **Original** Project Ending Date: 5-28-05 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.00 Facilitate Dept./Industry/Univ. Init.	5	2	25	1.25
1.01 Pre-construction partnering	5	3	25	1.25
1.02 Pre-design partnering	5	0	25	1.25
1.03 Public Meeting Facilitation	5	0	25	1.25
1.04 Engineering Unit Strategic Planning	5	0	10	.5
1.05 Task Force Deployment	45	5	20	9
1.06 Construction Industry Task Force	5	0	10	.5
1.07 Consulting Engineers Council	5	2	10	.5
1.08 Customer Care Initiative	5	2	0	.1
1.09 Reorganization Div. Of Env. Services	5	0	5	.25
1.10 Implementation of Cong. Buster Task Force	5	2	15	.75
2.0 Develop Recommendations	5	0	10	.5
TOTAL	100%			17.1%

Project Objectives: The purpose of this project is to manage experts in the areas of facilitation of departmental/industry/University initiatives, pre construction partnering, pre design partnering and public meeting facilitation, Engineering Unit strategic planning, and industry and University task force facilitation and deployment. These experts will provide Engineering Management Consulting Services to the NJDOT Capital Program

Project Abstract: The Capital Program Management Division of the New Jersey Department of Transportation requires that expert and experienced personnel participate in their projects. With the recent retirement of so many NJDOT personnel there exists a shortage of qualified individuals to facilitate the work.

The research plan to provide Engineering Management Consulting services to the Department of Transportation will include:

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Tel: 732-445-0579 Fax: 732-445-0577

1. Facilitation of Departmental/Industry/University Initiatives: Examples include Bridge Footprint Program, Local Bridge Design Standards, Congestion Management, Pavement Management, Safety Management Systems
2. Pre Construction Partnering
3. Pre Design Partnering and public meeting facilitation
4. Engineering Unit strategic planning
5. Industry and University task force facilitation and deployment

The final product of this work will consist of providing the New Jersey Department of Transportation with the necessary experts to conduct engineering management consulting.

1. **Progress this quarter by task:**
   - Facilitated strategic Congestion Buster Senior Staff retreat
   - Initiated tasks surrounding field implementation of construction issues
   - Planning for NJQI bi annual seminar/transportation summit
   - Developed and deployed agenda for Consulting Engineers Quarterly meeting
   - Facilitated DEP/DOT meeting regarding new Storm Water Regulations
   - Reevaluated Quick Fix Deployments
   - Reprioritized the NJDOT Task force implementation strategies
   - Facilitated construction partnering on Routes 1/9 over Amtrak
   - Coordinated and attended the NJQI bi annual seminar providing facilitation and organizational services.

2. **Proposed activities for next quarter by task**

   The Engineering Management Services Contract modification with Rutgers University CAIT/LTAP will be finalized. This modification was a result of an increase in scope of work and increased number of tasks associated with the original project intent. The increased scope of work includes but is not limited to providing organizational development, facilitation and process changes for the following new tasks:

   Statewide Logistics Task Force
   Construction Industry Task Force on Field based Issues
   Consulting Engineers Council Quarterly Meetings on Process and Design
   Inter-agency Statewide initiative on customer care
   Reorganization and subsequent creation of the Division Environmental Services
   Statewide interagency implementation of Congestion Buster Task Force
   Additional Tasks as directed by the Deputy Commission-NJDOT

   The services provided will increase the value of the contract by $50,000.

3. **List of deliverables provided in this quarter by task (product date**)
   A. Congestion Busters Task force review with Commissioner (1/6/2004)
   B. Congestion Busters Task force team meeting with Turnpike (2/8/2004)
   C. Customer Care review with commissioner (1/12/2004)
   D. NJQI planning (2/15/2004)
   E. CEC planning (1/15/2004)

F. Quick Fix triage (1/26/2004)
G. DEP stormwater negotiation (1/27/2004)
H. Task force prioritization (1/29/2004)
I. Quick fix meeting (1/30/2004)
J. Amtrak partnering and deployment (1/9, 2/4, and 2/5/2004)
K. Update to modification agreement discussion (2/13/2004)
L. DEP/DOT meetings (2/17)
M. NJQI planning (2/18)
N. CEC quarterly meeting (2/19)
O. NJQI summit 2/24 – (2/26/2004)

4. Progress on Implementation and Training Activities
   Not at implementation.

5. Problems/Proposed Solutions
   None at this time.

Total Project Budget	$50,000
Modified Contract Amount:	
Total Project Expenditure to date	$35,702
% of Total Project Budget Expended	71.4%

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QUARTERLY PROGRESS REPORT

Project Title:	New Jersey Interagency Emergency Management Plan
RFP NUMBER:	NJDOT/FHWA RESEARCH PROJECT MANAGER(S): Art Egan
TASK ORDER NUMBER/Study Number: Task Order No. 133 / 4-29000	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Rod Roberson
Project Starting Date: 3/18/2003 **Original** Project Ending Date: 3/18/2005 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1.00 Identify NJDOT rep	2		100	2
1.01 Meet with Agencies	3		100	3
1.02 Meet Individual Agencies	10		90	9
1.1 Identify Current State of Practice	20	25	40	13
1.2 Make Presentation to NJDOT	5	10*	35	2.25
LTAP Plan Concept			0	
2.0 Develop Recommendations	15	40	0	6
2.1 Options to accomplish Objectives	25	40	0	10
2.2 LTAP present findings	5		0	0
2.3 Develop Tasks	10		0	0
2.4 Present Plan	5		0	0
TOTAL	100			45.25%

Project Objectives:

1. To develop a team approach that incorporates state level public sector transportation resources and assets, including those owned and operated by New Jersey Transit, the Garden State Parkway, NJ Turnpike, and the Atlantic City Expressway, with those of the New Jersey Department of Transportation into an emergency management plan that meets or exceeds the goals of the State emergency management efforts.
2. To marry the resources of the multi-modal private sector transportation industry into the plan so as to allow for a combined public/private partnership/response.
3. To formally identify the Commissioner of Transportation as New Jersey's Transportation lead during all emergency operations.

Project Abstract: The need for ensuring mobility, function, and integrity of the State's transportation system during an emergency was realized during the tragedy of September 11, 2001 as well as during localized events such as the Rt. 80 Bridge fire and the associated damage from Hurricane Floyd. It is essential that New Jersey's multi-modal transportation network be kept in operation during an emergency.

A literature search will be conducted to determine the current state of practice of State and Federal agencies. This will be analyzed along with existing methods of sharing and communication among these agencies. Emergency planning issues prior, during, and after an incident will be addressed to identify roles and responsibilities of each agency.

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This project will provide the Commissioner of the New Jersey Department of Transportation with a formalized emergency response plan that promotes unification of the efforts of all agencies, maximum utilization of combined resources, and involvement of the private sector transportation industry. The plan will incorporate viable protective measures and alternative actions, and will suggest ways to consolidate the planning, response, and recovery efforts of the Atlantic City Expressway, NJ Turnpike, Garden State Parkway, and the New Jersey Department of Transportation into one unified and effective transportation plan.

Progress this quarter by task:

1.1 Additional review of collected literature produced need to revisit with Atlantic City Expressway representative.

1.2 *Met with Commissioner Lettiere on other matters and discussed some of the findings and how he would like program to proceed relative to report publishing and presentation. It was agreed that report should be published and moved.

2.0 Recommendations are under development for inclusion in report.

2.1 Recommendations are under development for inclusion in report.

Proposed activities for next quarter by task:

1.2 Interim report of findings to be published and presented to Commissioner Lettiere.

List of deliverables provided in this quarter by task (product date):

None at this time.

Progress on Implementation and Training Activities:

Not at implementation.

Problems/Proposed Solutions:

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None at this time.

Total Project Budget	$139,150
Modified Contract Amount:	$139,150
Total Project Expenditure to Date	$27,171
% of Total Project Budget Expended	19.53%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Demonstration Project – Beneficial use of Dredge Clay in Upland Sites
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Michael Riley
TASK ORDER NUMBER: 139 / 4-29053	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 07/15/2003 **Original** Project Ending Date: 07/14/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1. Literature Search	2%	1%	2%	2%
2. Unloading and Transporting of Clay to Test Area	25%	100%	100%	25%
3. Placement of Clay According to Technical Specifications	20%	100%	100%	20%
4. Geotechnical Field and Laboratory Testing	25%	60%	80%	20%
5. Analysis of Potential Use	15%	10%	10%	10%
6. Cost Analysis	8%	0%	0%	0%
7. Final Report	5%	25%	25%	1.25%
TOTAL				
	100%			78.25%

Project Objectives:

Project Abstract:

1. Progress this quarter by task: Completion of 80% of Laboratory Testing

2. Proposed activities for next quarter by task: Completion of Field Work, Preparation of Draft Final Report

3. List of deliverables provided in this quarter by task (product date): Additional laboratory testing results.

4. Progress on Implementation and Training Activities:

5. Problems/Proposed Solutions:

Total Project Budget	1 Year	$348,064.00
Modified Contract Amount:		
Total Project Expenditure to date		$299,542
% of Total Project Budget Expended	Year 1 and 2	86%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Monitoring of Construction Doremus Avenue Bridge Structure
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Nick Vittilo
TASK ORDER NUMBER: 99 / 4-26676	PRINCIPAL INVESTIGATOR: Hani Nassif
Project Starting Date: 01/01/2001 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	2%	0%	100%	2%
1. Finite Element Model Development and verification (Substructure & Superstructure)	5%	20%	90%	4.5%
2. Develop Instrumentation Plan and Install Sensors for LMC and Stage II sensors	20%	10%	100%	20%
3. Parametric Study	15%	10%	90%	13.5%
4. Perform Testing of LMC layers, Stage I and II before and After LMC, Monitoring and Data Collection	20%	10%	90%	18%
5. Prepare Recommendations to Modify AASHTO's, NJDOT's and LMC Procedures	20%	10%	70%	14%
6. Comparison of Analytical and Experimental Results including LMC layer	8%	10%	80%	6.4%
7. Progress Reports	5%	0%	90%	4.5%
Final Report	5%	10%	30%	1.5%
TOTAL	100%			85.4%

Project Objectives:

The Doremus Avenue bridge structure, located in Newark, NJ, is New Jersey's initial LRFD design. The construction project will involve replacement of an existing bridge structure that primarily carries truck traffic into the State's seaport area. The main objective of the overall five-year study is to instrument, monitor and evaluate the structure during and after construction. The evaluation process aims at assessing the new AASHTO LRFD design procedures and identifying what the New Jersey Department of Transportation (NJDOT) wishes to establish as future bridge design guidelines. The instrumentation schemes will be implemented during the construction phase. This will permit measuring the "undisturbed" behavior of the bridge and establishing the structure's "finger prints" prior to traffic opening. Both the superstructure and substructure will be instrumented and monitored simultaneously.

Project Abstract:

In 2002, the American Association of State Highway Transportation Officials (AASHTO) will adopt the Load and Resistance Factored Design (LRFD) Bridge Design Specifications as the standard by which all future bridge structures will be designed. The use of these Specifications will be mandatory for all States. New Jersey has committed to the adoption of the LRFD Specifications by January 2000. The LRFD Specifications considers the variability in the behavior of structural elements through the use of extensive statistical analyses to ascertain the behavioral variability. The LRFD Specifications continue to be refined and improved. However, many of the

Specifications' design approaches and methodologies have been adopted with limited or virtually no experimental validation. Therefore, there is a need to validate these new design procedures and models as well as to validate the integrity of LRFD designed bridge structures.

It is anticipated that the bridge will be instrumented to monitor its performance over a period of several years (5 years). It is also envisioned that the Doremus Avenue Bridge will act as a national "test bed" for verifying certain parameters of the AASHTO IRFD Bridge Design Specifications. The following sections describe the objective, scope, and tasks involved in developing analytical models and planning instrumentation schemes and sensor locations prior to the actual construction of the Doremus Ave. Bridge. The presented plan covers the first year of the project only. However, it is expected that the study will continue to allow for instrumentation, field-testing and long term monitoring. The overall project over the five-year period will consist of three Phases as follows:

- Phase I: Bridge Modeling, Instrumentation Planning, and Coordination of Tasks.
- Phase II: Bridge Instrumentation, Testing, and Verification prior to traffic opening.
- Phase III: Bridge Testing and long-term Monitoring after traffic opening.

1. Progress this quarter by task:

A. Latex Modified Concrete Layer:

1. Crack observation of LMC Layer, if possible.

B. WIM System

1. The WIM bending plate in Lanes 3 and 4 (North bound lanes) are connected and calibrated.
2. The WIM system is calibrated, however, because of the bump between the approach slab and the roadway there are an increased number of problem readings in the right southbound lane.
3. WIM system is currently communicating with the fatigue system and it is used as a trigger for the fatigue system.
4. WIM system data is being downloaded on a regular basis for purposes of truck weights and classification beyond the scope of the fatigue system WIM record. The WIM software can automatically generate truck class and weight reports.

C. Fatigue System

1. Fatigues system is being re-programmed to accommodate the full 4 lanes bridges. The connection to the fatigue system from the WIM lanes has been re-designed due to changes in the design of the WIM system. The WIM system model and software originally noted in the Doremus plans has become obsolete and the new software has been installed. The new software required adding new hardware to the fatigue system to accommodate for the text information.
2. Fatigue system is now programmed to receive WIM triggers from all 4 lanes. The connection to the fatigue system from the WIM lanes has been re-designed due to changes in the design of the WIM system.
3. The memory capacity of the system was expanded to 2GB with a new RAM Card. This expansion allows for 4 lanes of truck records with up to 1000+ trucks per lane. The previous 128MBx2 configuration would be inadequate for the current traffic. At the present capacity, the system can collect truck data for three weeks before a site visit is required to download the data.
4. Power difficulties with the Fatigue system have been resolved with changes to the software. Originally, the system was designed to power down when a lower threshold of voltage was reached (to protect the memory cards). The system now has a less sensitive threshold value and is programmed to re-initialize automatically.
5. Problems with erroneous and empty data sets have been resolved. The remedy was a software setting that would balance the scan rates from two different input sources to read at the same rate.

2. Proposed activities for next quarter by task:

1. Continue monitoring of the LMC strain profile and measuring its response under field and normal truck traffic conditions.

2. Perform static and dynamic testing of the full bridge (Stages I and II) under normal truck traffic. This will include WIM truck weight data, deflection measurement using LVDT and Laser system, Strain in main girders and secondary members using the STS, and fatigue stress ranges and truck load cycles.
3. Calibrating the fatigue system to capture the truck traffic on the bridge (from WIM system)
4. Correlation of data between WIM bending plate system and other data collection systems on the superstructure.
5. Perform analytical and experimental comparison of FE model and results from test truck as well as WIM-Based truck configurations. Emphasis will be given for multiple presence effects.
6. Develop truckload statistics based on long term Doremus-WIM data and compare with other NJ WIM locations. If needed, the use of portable WIM system will be examined to check data from other locations.

3. List of deliverables provided in this quarter by task (product date):
   N/A
4. Progress on Implementation and Training Activities:
   N/A
5. Problems/Proposed Solutions:
   N/A

Total Project Budget	$736,466
Modified Contract Amount:	
Total Project Expenditure to date	$585,655
% of Total Project Budget Expended	80%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	New Jersey Local Congestion, Safety, & Security Initiative
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Nazhat Aboobaker/ Patty Leech
TASK ORDER NUMBER: Task Order No. 132/4-26993	PRINCIPAL INVESTIGATOR: Ali Maher/Joe Orth/Claudia Knezek/Carol Greenberg
Project Starting Date: 12/11/2002 **Original** Project Ending Date:12/11/2004 **Modified Completion Date:**	Period Covered: 1st Quarter, 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
1.1 MPO Forum Study	5	20	20	1
1.2 Present NJDOT/FHWA	5	0	0	0
2.1 Survey Report	20	50	50	10
3.1 Crash Data Training	10	10	10	1
3.2 Safety Conscious Planning Forum	10	30	30	3
3.3 SCP Local Forums	20	0	0	0
3.4 Official Conference Proceedings	5	0	0	0
3.5 Promote Congestion Mitigation Locally	10	10	10	1
3.6 Introduce ITS Concepts	5	10	10	.5
3.7 Provide Public Safety Training	5	20	20	1
Final Report	5	25	25	1.25
TOTAL	100%			18.75%

Project Objectives: Rutgers CAIT-LTAP will facilitate a clearinghouse partnership between the FHWA-NJ Division, NJDOT, county, and local governments for the following purposes:

1. Promoting local best practices that relate to Safety Conscious Planning
2. Supporting Safety Awareness that results in the reduction of roadway fatalities, development of a uniform resource dissemination system, and the creation of a statewide SCP Forum Network
3. Introducing SCP that enables locals to collect more accurate traffic data for responding to critical safety needs.
4. Training municipalities on preventing crashes on local roadways.
5. Identifying roles of local governments in emergency preparedness, as it relates to Safety Conscious Planning.

Project Abstract: The New Jersey Congestion, Safety, and Security Initiative was developed to support the FHWA's "vital few" strategic goals on local roadways through the provision of training outreach, coordination of information dissemination, and the development of a statewide network that values roadway safety as a major priority. In New Jersey, traffic volumes have impacted the mobility and safe travel of motorists on the state, county, as well as local roadway systems. This widespread congestion has increased the number of crashes and incidents each year, which also affects security and incident management initiatives. The national Safety Conscious Planning Model is being implemented at all levels of government, in order to support the improvement of roadway safety. A statewide Safety Forum is being organized through the Metropolitan Planning Organizations with Rutgers CAIT-LTAP providing specialized training in the use of crash data and roadway inventories. These tools and other technologies have been effective for implementing cost effective countermeasure treatments that improve local roadways where nearly 50% of all crashes occur annually.

1. Progress this quarter by task:

Task	Description
1.1 MPO Forum Study	Outreach to National LTAP Local Safety Management Committee for data on local countermeasures (1/6/04)
2.1 Survey Report	Municipal Data Collection has continued during this period. Sample has increased from 108 to 222 respondents (1/1-2/18/04).
3.1 Crash Data Training	Participated in the following NJTR-1/Police Manual Meetings: 1/14/04 - MMUCCs Integration 2/5/04 - MMUCCs Integration 2/19/04 - Revision of MMUCCs Adjustments
3.2 Safety Conscious Planning Forum	2/3/04 – NJ Forum Committee Meeting was held to reschedule program and revise program format. 3/9/04 – Scheduled NJ Forum Committee Meeting
3.5 Promote Congestion Mitigation Locally	2/18/04 – NJDOT Traffic Operations Tour (NJWZSP)
3.6 Introduce ITS Concepts	2/18/04 – NJDOT Traffic Operations Tour (NJWZSP)
3.7 Provide Public Safety Training	1/30/04 & 2/17/04 Teleconference Meeting on MAST sponsored Pavement Marking Retro-reflectivity Workshop 2/6/04 - Traffic Control Refresher Workshop 2/27/04 – Traffic Control Refresher Workshop

2. Proposed activities for next quarter by task:

Task	Proposed Activities
1.1 MPO Forum Study 1.2 Present NJDOT/FHWA	Develop Statewide Database of Roadway Safety Organizations by County
2.1 Survey Report	Prepare findings for distribution at Forum

3.1 Crash Data Training	Continue to review NJTR-1 & organize training
3.2 Safety Conscious Planning Forum	Develop Promotional Publications Reorganize Program Plan Invite Guests Attendance at MPO Meetings
3.3 SCP Local Forums	Organize Training Through Existing Active Programs (e.g. Police County Traffic Officers, So. Jersey Traffic Safety Alliance, Morris County Safety Committee, AAA)
3.4 Official Conference Proceedings	Solicit Committee Input on Format & Results
3.5 Promote Congestion Mitigation Locally	Incorporate into State & Local Best Practice Session at Local Forums
3.6 Introduce ITS Concepts	Incorporate into State & Local Best Practice Session at Local Forums
3.7 Provide Public Safety Training	4/1/04 – Work Zone Safety Awareness Conference 4/7 & 4/8 – Sponsor MAST Regional Pavement Marking Retro-reflectivity Workshop May 2004 – Schedule Intersection Safety Workshop
Final Report	Integrate Results of Quarterly Reports into Final Format

3. List of deliverables provided in this quarter by task (product date):

Task	Deliverables	Item/Date
1.1 MPO Forum Study	LTAP Library of Publications	Outreach to National LTAP Local Safety Management Committee for data on local countermeasures (1/6/04)
2.1 Survey Report	LTAP Library of Publications	Municipal Data Collection has continued during this period. Sample has increased from 108 to 222 respondents. (1/1 - 2/18/04)
3.1 Crash Data Training	Distribute Technical Information Arranging Speaking Engagements	Participated in the following NJTR-1/Police Manual Meetings: 1/14/04 - MMUCCs Integration 2/5/04 - MMUCCs Integration 2/19/04 - Revision of MMUCCs Adjustments
3.2 Safety Conscious Planning Forum	Statewide Forum (1) Local Symposiums (15)	2/3/04 – NJ Forum Committee Meeting was held to reschedule program and revise program

	Distribution of Technical Information Arranging Speaking Engagements	format. 3/9/04 – Scheduled NJ Forum Committee Meeting
3.5 Promote Congestion Mitigation Locally	Distribution of Technical Information Arranging Speaking Engagements Identify the Roles of Transportation Agencies During Events Discuss Roles & Responsibilities of Locals after an Event	2/18/04 – NJDOT Traffic Operations Tour (NJWZSP)
3.6 Introduce ITS Concepts	Distribution of Technical Information Arranging Speaking Engagements Identify the Roles of Transportation Agencies During Events Discuss Roles & Responsibilities of Locals after an Event	2/18/04 – NJDOT Traffic Operations Tour (NJWZSP)
3.7 Provide Public Safety Training	Expanded list of subscribers Distribution of Technical Information Arranging Speaking Engagements Identify the Roles of Transportation Agencies During Events Discuss Roles & Responsibilities of Locals after an Event	1/30/04 & 2/17/04 Teleconference Meeting on a MAST sponsored Pavement Marking Retro-reflectivity Workshop 2/6/04 - Traffic Control Refresher Workshop 2/27/04 – Traffic Control Refresher Workshop

4. Progress on Implementation and Training Activities:

Training	Description
3.1 Crash Data Training	Participated in the following NJTR-1/Police Manual Meetings: 1/14/04 - MMUCCs Integration 2/5/04 - MMUCCs Integration 2/19/04 - Revision of MMUCCs Adjustments
3.2 Safety Conscious Planning Forum	2/3/04 – NJ Forum Committee Meeting was held to reschedule program and revise program format. 3/9/04 – Scheduled NJ Forum Committee Meeting
3.7 Provide Public Safety Training	1/30/04 & 2/17/04 Teleconference Meeting on MAST sponsored Pavement Marking Retro-reflectivity Workshop 2/6/04 - Traffic Control Refresher Workshop 2/27/04 – Traffic Control Refresher Workshop

5. Problems/Proposed Solutions: Some MPOs and NJDOT Planning Department representatives were resistant to promoting the Safety Conscious Forum Program that was organized by national FHWA representatives. The 2/3/04 Forum Committee Meeting was held to discuss these issues and reorganize the Forum to benefit the New Jersey groups. Presently, the rescheduled Forum date is being decided by the Washington FHWA office and a second committee meeting will be held at NJDOT on 3/9/04.

Total Project Budget	$741,836
Modified Contract Amount:	$752,433
Total Project Expenditure to date	$376,113
% of Total Project Budget Expended	49.997%

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Instrumentation and Monitoring of Bridge Approach Slabs – Phase II
RFP NUMBER: N/A	NJDOT RESEARCH PROJECT MANAGER: Nick Vittilo
TASK ORDER NUMBER:	PRINCIPAL INVESTIGATOR: Hani Nassif
Project Starting Date: 1/1/2001 **Original** Project Ending Date: 12/31/2004 **Modified Completion Date:** 12/31/2004	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search				
1. Instrumentation Plan and Field testing	30%	20%	100%	30%
2. Calibration of Sensors and DAS	20%	30%	90%	18%
3. Data collection and LTRM	20%	30%	80%	16%
4. FEM Verification	10%	0%	8%	8%
5. Progress Reports & Technical Memorandum	15%	10%	70%	10.5%
Final Report	5%	0%	0%	0%
TOTAL	100%			82.5%

Project Objectives:

To develop and specify new design method for bridge approach slab. The main objective of this study is to evaluate the cracking behavior of approach and transition slabs and the interaction between soil-slab-vehicle system. The scope of the study is as follows:

1. Develop a detailed 3-D finite element model that would incorporate the nonlinear and cracking behavior of reinforced concrete as well as the inelastic soil properties.
2. Compare results from the 3-D model with distress observed on actual structures
3. Perform a comparative parametric study to optimize the slab design.
4. Instrument and monitor the long-term performance for the newly designed and constructed approach and transition slabs on Doremus Avenue bridge project.

Project Abstract:

Bridge approach slabs provide a transitional roadway between pavement and the actual structure of the bridge. This transition is crucial in reducing the dynamic effects imposed on the bridge by traffic and truckloads. However, under the effect of heavy impact loads, coupled with unknown or inadequate soil conditions (e.g., settlement, embankment bulging, poor fill material, inadequate compaction, poor drainage, etc.), a number of approach slabs in the State of New Jersey have exhibited transverse structural cracking. This type of transverse cracking, as observed by site engineers of the New Jersey Department of Transportation (NJDOT) as well as the Rutgers Team, occurs even on relatively newly constructed slabs. Various design schemes of the approach and transition slabs (e.g. alteration of the thickness of the approach slab, adding number of rebars, increasing concrete strength, etc.) have been implemented, however, the structural cracking have persisted.

Despite the widespread occurrence of bridge approach problems, only a small number of research studies have been performed on the subject. Few studies have been developed for evaluating the cracking behavior of bridge approach slabs. However, this problem is becoming an increasingly important topic in the effort to deal with the deteriorating infrastructure and rehabilitation of roadways. Major decisions must be made to allocate the limited funds available for repair, rehabilitation and/or replacement on the basis of a detailed evaluation of the structural

integrity of bridge approach slabs. Therefore, there is a need for new design schemes that can ensure crack-free slabs and for the field monitoring their behavior under actual truck traffic.

1. Progress this quarter by task:
   - Instrumentation and field testing is completed
   - Static and dynamic testing of the approach slab and calibrating the model using the new 3D model.
   - Remodel FE model for the embedded beam to reflect the error made by the contractor.

2. Proposed activities for next quarter by task:
   - Long-term monitoring
   - Visual inspection for cracks and correlates cracks to strain data.

3. List of deliverables provided in this quarter by task (product date):
   N/A
4. Progress on Implementation and Training Activities:
   N/A
5. Problems/Proposed Solutions:
   N/A

Total Project Budget	NA add-on
Modified Contract Amount:	
Total Project Expenditure to date	NA add-on
% of Total Project Budget Expended	NA add-on

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NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	The Development of a Performance Specification for Granular Base and Subbase Material
RFP NUMBER:	NJDOT RESEARCH PROJECT MANAGER: Mr. Anthony Chmiel
TASK ORDER NUMBER/Study Number: Task Order No. 83 / 4-23914	PRINCIPAL INVESTIGATOR: Dr. Ali Maher
Project Starting Date: 3/01/2001 **Original** Project Ending Date: 12/31/2002 **Modified Completion Date: 8/31/2003**	Period Covered: 1st Quarter 2004

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%	0%	100%	5%
1. Material Collection	5%	0%	100%	5%
2. Laboratory Testing	60%	5%	100%	60%
3. Calibration	10%	10%	100%	10%
4. Reporting	20%	30%	100%	20%
Final Report				
TOTAL	100%			100%

Project Objectives:

- Determine the potential change in performance testing results when comparing aggregates from the different areas of the NJDOT gradation specification
- Evaluate the use of recycled asphalt pavement (RAP) and recycled concrete aggregate (RCA) under similar performance testing
- Mix the RAP and RCA to different percentage blends of current NJDOT specified aggregates and provide guidance as to the maximum amount of recycled material based on performance testing

Project Abstract:

Currently, the NJDOT specifies base and subbase aggregates through gradation requirements. However, the current gradation specifications are very broad and could potentially allow for the material's performance to vary. Therefore, a research project was developed to evaluate the performance of the aggregates at gradations that represented the high, middle, and low end of the gradation specification band. The aggregate's natural gradation was also tested. This would allow the NJDOT to justify the potential modifying of the gradation specification to maximize the performance of the aggregate material.

1. Progress this quarter by task:

Repeat resilient modulus tests were completed to help clear up some discrepancies in the test results. A final report is being prepared and should be delivered to the NJDOT for the quarterly meeting in March 2004.

2. Proposed activities for next quarter by task:

N.A.

3. List of deliverables provided in this quarter by task (product date):

N.A.

4. Progress on Implementation and Training Activities:

N.A.

5. Problems/Proposed Solutions:

N.A.

Total Project Budget	$286,041.00
Modified Contract Amount:	
Total Project Expenditure to date	$282,893
% of Total Project Budget Expended	99%

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Total Project Budget	$318,458.00
Modified Contract Amount:	No
Total Project Expenditure to date	$318,458
% of Total Project Budget Expended	100%

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